
Regulatory certainty to support investment in full-fibre broadband

Ofcom's approach to future regulation

STRATEGIC POLICY POSITION

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About this document

Full-fibre broadband will be increasingly important to people and businesses, as they demand more from their communications services over the coming decade and beyond. Full-fibre networks will also play an important role in the deployment of new 5G mobile services, which are intended to deliver faster speeds and increased capacity for mobile users – as well as paving the way for innovative new applications.

In February 2016, Ofcom published its Strategic Review of Digital Communications. The review set out our strategy for regulating communications markets through to 2026. It represented a major strategic shift to incentivising more investment in full-fibre networks. Since then we have seen a number of companies commit to investing in full fibre.

This document sets out how we plan to reform the way we carry out competition assessments in telecoms markets, to further support network investments in the long term. We also explain the issues we will consider when managing the transition from copper to fibre networks over the coming years.

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1. Executive Summary

Ofcom's approach to future regulation – main points

Our Strategic Review of Digital Communications in 2016 represented a step change in our approach towards supporting investment in full-fibre broadband. The UK Government has also signalled strong support for full fibre and wants 15 million premises to be connected by 2025.

Investment in full-fibre networks is now underway from a range of parties. This investment could have a transformative effect on the market, and will need to be supported by consistent, predictable regulation over a number of years.

This document sets out how regulation will evolve in the coming years, under our existing competition and investment strategy. To promote investment, Ofcom will focus on:

- **More holistic consideration of business and residential markets** to address areas where telecoms operators still have 'significant market power'. We will focus on incentivising companies to build networks by opening up infrastructure to competing operators. This should be complemented by regulation where necessary to protect consumers and competition.
- **Supporting a move towards unrestricted duct and pole access.** Companies will have greater flexibility to use Openreach's telegraph poles and underground 'ducts', to lay fibre networks that serve residential customers or business customers. At present, duct and pole access is restricted to networks focusing primarily on the residential market.
- **Different regulatory approaches in different parts of the country.** We will vary our approach depending on the intensity of network competition in different areas. This will support widespread availability of full-fibre across the UK, even in the most remote areas. Where competing networks emerge, there will be scope for greater deregulation.
- **Longer-term certainty for investors.** We will lengthen the period of our telecoms competition assessments, from three years to at least five.
- **Public intervention in remote areas where there is no prospect of network competition.** While competitive investment will drive fibre investment in remote areas, regulation is only part of the solution to securing better broadband for people across the country. The Government has recently announced a proposal to intervene to support full-fibre network construction in these areas.
- **A smooth transition from older copper networks to full fibre.** As copper phone and broadband networks are replaced by fibre, regulation will need to consider how services on the old networks are priced, and the value of the assets recovered over time. During the transition period, we will prioritise stable regulated products and prices, and consistent quality of service. Consumers will need to be protected during the transition – for example, by ensuring that vulnerable people receive appropriate assistance during the migration process.
- **Preserving incentives for Openreach to invest.** We will ensure that Openreach has the opportunity to make higher returns where a risky investment is successful, to compensate it for taking that risk. We applied this 'fair bet' principle to Openreach's superfast broadband investments, resulting in a 10-year period of pricing flexibility, and Openreach earning cumulative returns significantly higher than its cost of capital.

The Strategic Review of Digital Communications signalled a major strategic shift to incentivising network investment

- 1.1 In our Strategic Review of Digital Communications of 25 February 2016 ('the DCR'), we set out how we would promote investment and competition to deliver better broadband wherever people live or work. We have done this by:
- **Focusing on large-scale full-fibre investment through our regulatory decisions.** We required Openreach – BT's network arm – to open up its network of telegraph poles and underground cable ducts to allow rivals to lay their own fibre. We also set prices for Openreach's wholesale services in a way that supported investment.
 - **Reforming Openreach through BT's voluntary commitment to legal separation.** Under the new arrangements, Openreach must consult formally with customers such as Sky, TalkTalk and Vodafone on large-scale investments. The new model is designed to ensure that Openreach is more responsive to the demands of all its customers – not just BT – and increases its fibre investment.
 - **Improving quality of service across the telecoms industry.** We have set tougher quality standards on Openreach, particularly for business products, where service was previously unacceptable.
 - **Automatic compensation for broadband and landline telephone customers.** We agreed a new scheme that will see the major broadband and landline providers give their customers automatic compensation when things go wrong (from early 2019).
 - **Better information on telecoms companies' performance.** We improved consumer information on how different operators compare for service quality.
 - **Working with the UK Government to give every home and business in the UK the right to request decent broadband.** We expect to designate a provider, or combination of providers, by summer 2019, who will then be responsible for delivering the new universal broadband service.¹

We have seen encouraging signs from industry in response

- 1.2 Since we published the DCR, we have seen momentum build behind investment in full-fibre broadband. Current commitments by broadband companies could see up to six million premises having access to full fibre by 2020. Earlier this year, the Government set a target for 15 million premises to receive full-fibre broadband by 2025.
- 1.3 A number of full-fibre operators have attracted new investors in recent months, including from institutions focused on infrastructure investment. A number of communications providers now have plans for significant ultrafast investments:
- Virgin Media's Project Lightning continues, aiming to expand its network to an additional four million premises by 2020, of which two million will be full fibre;

¹ Ofcom, June 2018. Implementing the Broadband Universal Service Obligation.
https://www.ofcom.org.uk/_data/assets/pdf_file/0013/115042/implementing-broadband-uso.pdf

- CityFibre and Vodafone have partnered to deliver full fibre to one million homes by 2020, with possible further expansion later;
 - Hyperoptic has an ambition to pass two million homes and businesses by 2022;
 - TalkTalk, in partnership with Infracapital, has an ambition to reach three million homes with full fibre in the medium term; and
 - Openreach has announced a plan to roll out full fibre to three million homes by 2020 and aims to reach 10 million homes by 2025.
- 1.4 At the same time, we have seen Openreach become more responsive to early investment proposals from its wholesale customers, under the new model of legal separation. For example, in July 2017 Openreach consulted its wholesale customers on co-investment opportunities and risk-sharing in full fibre. We want to see the same responsiveness to requests from competitors to use Openreach’s ducts and poles for fibre deployment.
- 1.5 Taken together, these announcements are a sign of positive intent from industry for more fibre deployment. The nature of building fibre networks means that these are necessarily long-term projects, with some investments taking several years to complete.
- 1.6 We understand that large-scale network investment is risky. We believe that regulation has a strong role to play in fulfilling the Government’s target for full-fibre networks to be available to 15 million premises by 2025. We want to make sure that the regulatory conditions are right, so that operators’ investment plans translate into widespread availability of full-fibre networks. We must also ensure that our regulatory approach adapts to reflect the changing market dynamics on infrastructure availability, service usage and competition. This is not a small undertaking: developing and implementing new regulatory approaches will require detailed work and consultation.
- 1.7 This document sets out our initial thinking on how the regulatory environment needs to evolve in future. The two main areas where we see that adaptation is necessary are: the way we carry out telecoms competition assessments; and the way we manage the transition from copper to fibre networks.

Our approach to competition assessments will need to reflect investment in full-fibre networks

Regulation must reflect the effect of convergence at the network level

- 1.8 Historically, while copper and fibre-to-the-cabinet networks could meet the needs of most households and small businesses, large businesses and communications providers needed high-speed, dedicated leased lines. As a result, it made sense to review these markets separately. We have done so through the wholesale local access (‘WLA’) review, which examines the wholesale services used by telecoms providers to supply broadband to their customers; and the business connectivity market review (‘BCMR’), which examines high-speed, dedicated ‘leased line’ connections used by large businesses.
- 1.9 However, investors in full-fibre networks are increasingly looking to offer a range of services over a more common underlying fibre infrastructure: ultrafast broadband to

households and small businesses; leased lines to larger businesses; and ‘backhaul’ for mobile operators, who use fixed broadband lines to transmit data between mobile sites. Mobile and fixed wireless services will increasingly use common wireless infrastructure and technology.

- 1.10 Since the same underlying fibre network will increasingly be used to deliver a range of different services for business and residential customers, it no longer makes sense to consider residential and business access markets separately.
- 1.11 Before the DCR, our approach focused on requiring Openreach to provide wholesale access to its network, to allow competitors to offer retail services in competition with BT. This approach was successful in seeing major competitors challenge BT at the retail level but was not designed to stimulate effective competition to Openreach’s network. In much of the country, Openreach still runs the only major landline and broadband network. So, to drive increased competition at the network level, regulation should in future focus on addressing the enduring ‘significant market power’ that stems from Openreach’s existing physical telecoms network, based around its ducts and poles infrastructure.
- 1.12 To reflect the technical capabilities of full-fibre networks, our new approach to reviewing telecoms markets needs to recognise the importance of physical infrastructure. We will now consider access networks and services more holistically, focusing first on continuing to open up Openreach’s physical infrastructure.
- 1.13 Taking a network-focused approach means that we will need to assess competition at two levels. Our first, ‘upstream’ assessment will focus on physical telecoms infrastructure, such as ducts and poles. Our second, ‘downstream’ assessment will consider the need for wholesale regulation depending on where there are competing networks, or where competing networks have a good prospect of emerging.

We plan to extend the circumstances when competing telecoms operators can use Openreach’s network of ducts and poles to deploy networks

- 1.14 Openreach’s control of the main telecoms network means it can use its existing, widely-available network of ducts and poles to deploy fibre more cheaply and quickly than its competitors. Improving access to Openreach’s ducts and poles for rival operators can help to address this enduring advantage for Openreach in deploying fibre.
- 1.15 We improved access to ducts and poles in the 2018 WLA review, through new access obligations on Openreach. This measure could only be offered to companies primarily deploying broadband and fixed telephony networks, because it was a remedy to competition problems identified in the defined WLA market. This restriction means that full-fibre operators using duct and pole access must demonstrate that they have a firm intention to deploy broadband – a hurdle that Openreach does not face.
- 1.16 Under our new structure for competition assessments, we plan to introduce proposals that seek to provide unrestricted access to Openreach’s ducts and poles nationwide. An unrestricted remedy would provide greater flexibility, better reflecting the needs of

operators investing in full-fibre networks to provide a range of services; for example, initially leased lines to businesses, and later broadband to homes.

- 1.17 We will consult on unrestricted duct and pole access in the autumn, with a view to introducing the remedy by the start of 2020.

Duct and pole access will support competitive full-fibre investment, but deployments will vary across the country

- 1.18 As fibre investment increases, network availability and competitive intensity will vary across the country. We plan to vary regulation by different geographies to reflect the local competitive intensity, and to ensure that people and businesses across the UK are able to get access to the new networks. Part of the new framework for our regulation will be understanding what these different geographic areas might look like, and their size and location. In this document, we outline a possible framework for how geographic regulation might work. Our approach will be subject to consultation in autumn 2018.

- 1.19 In overview, we believe we will need to recognise at least three different geographic areas: competitive, potentially competitive and non-competitive:

- **Competitive areas will be those where there is effective competition between networks.** The presence of three effectively competitive fixed networks, available to serve the majority of premises within the area, may be sufficient to allow deregulation.
- **Potentially competitive areas will be those where we believe effective competition between fixed networks could emerge.** We will identify these areas based on whether it is economic to build competing fibre networks, considering factors that operators identify as important, such as population size and density.
- **Non-competitive areas will be where network competition is unlikely to emerge** and regulation is likely to be required in the longer term.

- 1.20 While the availability of even one full-fibre network in an area will bring significant benefits for consumers, our ultimate aim is to promote wide and extensive availability of multiple competing full-fibre networks. In the DCR, we said a good outcome in the long term would be to achieve network competition of around 40% of households. Since then, we have seen a number of announcements of deployment and strategic intents to invest in fibre, which could mean competition drives fibre deployment to a greater proportion of the UK. In its recent Future Telecoms Infrastructure Review (FTIR), the Government has estimated that a similarly substantial portion of the country could support three or more networks.

- 1.21 However, it remains unclear exactly where new entrant fibre deployments might be built. In considering potentially competitive areas, we will look at those areas that have underlying economic characteristics that could support new entrant fibre build. Our initial view is that up to 60% of premises are in areas that could be attractive to new entrants building fibre networks, given the common underlying economic characteristics of these areas. While new-entrant investment may not cover this entire area, our estimate indicates the possible scope of the potentially competitive area where we might see network competition as a result of market investment, building on duct and pole access.

As a result of network investment, downstream regulation will need to vary geographically to reflect the local competitive intensity

- 1.22 We will seek to apply an unrestricted duct and pole access remedy nationwide, but regulation of Openreach's services will vary by geographic area.
- 1.23 In competitive areas, we will remove regulation of Openreach's services but may apply targeted intervention, if required, to protect vulnerable consumers from high price rises.
- 1.24 In potentially competitive areas, we will incentivise new network deployment while ensuring consumers remain protected. We will support investment through continued pricing flexibility for higher bandwidth services, while safeguarding people who rely on lower bandwidths from the risk of high prices.
- 1.25 In the WLA 2018, we introduced the 'anchor pricing' approach to superfast broadband, promoting investment while protecting consumers by establishing a benchmark product with a regulated price. We believe the anchor pricing approach continues to be relevant in future, regardless of technology, and especially in the context of protecting consumers during the migration from copper to fibre.
- 1.26 If prices were volatile during the transition from copper to full-fibre networks, this would cause uncertainty, potentially undermining consumer confidence in the new network and services. In order to avoid this, we see significant value in broadly stable anchor pricing during switchover, taking into account inflation. This stability would allow for investment certainty and a managed migration to new services. Beyond this period of transition, we would take into account a wide range of factors when considering the level of any anchor pricing. As part of this, we may consider the need to allow a small pricing premium for a full-fibre based anchor product, to reflect its higher quality and consequential higher value.
- 1.27 In areas where network competition is unlikely to develop, further regulation is likely to be necessary to deliver good outcomes. In parts of the country where duct and pole access is ineffective in promoting competition, we want to ensure that consumers are still able to benefit from increased options and innovation. Therefore, we expect to ensure choice and value for money for consumers through additional regulation. This will include ensuring that wholesale regulation protects consumers from excessive price rises. As well as regulating wholesale access, we will also explore the case for requiring Openreach to make available unlit strands of its optical fibre to competing providers, who could attach their own equipment to deliver dedicated connections to their customers (a process known as 'dark fibre').
- 1.28 We plan to consult on downstream markets and remedies in 2019 and 2020, with a view to having new regulation in place for downstream services from April 2021.

Openreach should have the opportunity of a fair bet on its future full-fibre investments

- 1.29 We recognise that Openreach needs the opportunity to make higher returns when a risky investment is successful in order to compensate it for the chance a risky investment may fail (the ‘fair bet’ principle).
- 1.30 We applied this principle to superfast broadband investment, resulting in an initial 10-year period of pricing flexibility. We concluded that, given the nature of these particular investments, Openreach should be given the ability to earn cumulative returns in the range of 12-14%, to compensate it for upfront risks. We estimate that Openreach’s actual return on its superfast investments will be around 15%.
- 1.31 As we set out in the WLA 2018, we believe this principle remains appropriate and important to support investment. We will apply the fair bet principle to full-fibre investment in a consistent way.

Public intervention may be required to reach the most remote areas

- 1.32 In non-competitive areas, regulation is only part of the solution to securing better broadband for people and businesses. As the National Infrastructure Commission recognised in its recent assessment, public intervention is likely to be required to provide full fibre in areas where there is otherwise no economic case for its deployment.
- 1.33 In the FTIR, the Government has announced a proposal to intervene to support the deployment of full fibre networks in non-competitive areas. It has proposed an ‘outside-in’ approach, ensuring that fibre network build starts early in non-competitive areas and anticipates some level of public subsidy will likely be required.

A longer period for competition assessments will provide more certainty

- 1.34 In recent years we have supported changes to European legislation to extend the mandatory period for market reviews. We agree with investors that greater certainty over a longer timescale is needed than the current three-year market review period. We plan to introduce a longer timescale to reflect the commercial realities of fibre deployment, extending the period of our competition assessments from three years to at least five.

We will ensure regulation is clear and predictable in the transition from copper to fibre networks

- 1.35 Our regulation needs to take into account the transition from copper to fibre that will take place in the coming years. We will adopt policies that promote investment while protecting consumers during this period of significant change. Stable regulated products and prices, as well as continued good service, will be essential during the transition period. We will also ensure that regulation continues to protect consumers during the migration period,

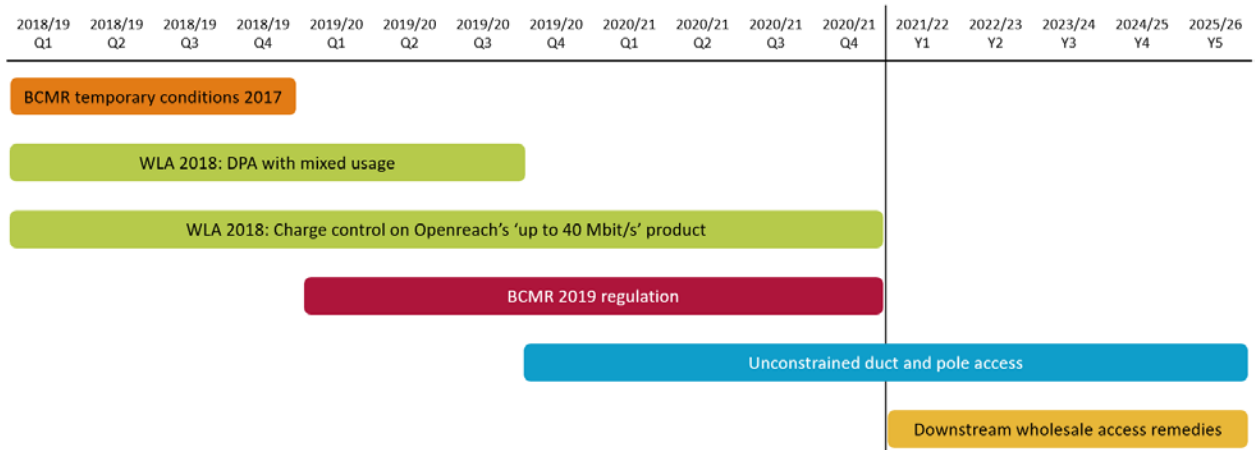
recognising that additional, targeted protections may be required to support vulnerable consumers.

- 1.36 Once consumers and businesses migrate from legacy networks on to full-fibre, the copper network will eventually be decommissioned. Given that the deployment of fibre will ultimately end the life of Openreach's copper assets, we recognise that there is a risk that Openreach could be left with unrecovered – or 'stranded' – copper assets at the point of copper switch-off. We will consider how such costs should be recovered, taking into account the impact on consumer prices, the need to maintain copper quality, investment incentives and competitive intensity.
- 1.37 We will need to address the questions of when and how migration from the copper network will take place, and its implications for consumers, industry and regulation. Many considerations will require detailed analysis and consultation. We expect the transition process will be led by Openreach, whose detailed proposals for transition will inform how we address these issues.

Several steps are required to implement our new approach outlined in this document

- 1.38 Our new regulatory approaches will be implemented as existing regulations draw to a close. This document will be followed by more detailed consultations, covering a number of areas where change is required to deliver the ultrafast broadband networks that people and businesses need for the future.
- 1.39 To introduce the benefits of unrestricted duct and pole access as quickly as possible, we intend to consult in autumn 2018 on introducing unrestricted duct and pole access to take effect from the start of 2020. We believe this regulation is likely to remain necessary for the long term. As it is desirable for future telecoms competition assessments to be aligned, we aim to have this regulation in place until 2026 so it is reviewed at the same time as the new downstream remedies we introduce in 2021.
- 1.40 During the course of 2019 and 2020, we plan to consult on downstream access regulation. We are minded to introduce new downstream regulation that varies by geographic area, to coincide with when regulation imposed under the WLA 2018 will need to be reviewed in 2021. This new downstream regulation will replace both the WLA and the BCMR in future.
- 1.41 Regulation imposed under the BCMR 2016 will expire in April 2019. We therefore need to put in place some regulation of leased lines services from April 2019. However, as noted, we propose to introduce new, long-term downstream regulation, for both the WLA and BCMR, by April 2021. The BCMR will consider proposals for dark fibre access that are consistent with our broader objective to ensure that downstream access regulation does not undermine the incentives to invest in new networks. In line with this objective, we may consider limiting dark fibre to areas or routes where there is unlikely to be investment in competing networks to Openreach.
- 1.42 These timelines are set out in Figure 1.1.

Figure 1.1: Roadmap for implementation



2. Our strategy

Our strategy is to secure full-fibre investment by promoting network-based competition

- 2.1 Many people and businesses will demand increasingly more from their phone and broadband networks over the next decade. Significant investment in new full-fibre networks is needed to meet future consumer and business demand.
- 2.2 Mobile networks will also depend on full-fibre networks to meet ever-growing consumer demand for mobile broadband. Mobile operators will increasingly use fibre networks for connectivity, particularly for 5G, the next generation of mobile broadband services. Securing more investment in fibre will therefore be important to support the UK's ambition to become a world leader in 5G.
- 2.3 With these market developments in mind, in March 2015 we announced a Strategic Review of Digital Communications ('the DCR'), the largest strategic review we had conducted in ten years.² The review concluded in 2016 and established our approach to regulating communications markets for the next decade.
- 2.4 We concluded that the UK's communications sector needed significant investment to meet the needs of people and businesses. We set out a strategy to support investment in new full-fibre networks and for securing widespread availability of good broadband more generally. Our strategy has three broad aspects:
- **A shift to large-scale investment in more fibre.** We recognised that regulation needed to evolve to meet demand for faster, more reliable full-fibre networks. To achieve this, we concluded that Openreach should open up its network, allowing easier access for rivals to lay their own fibre cables along Openreach's telegraph poles and in its underground cable 'ducts'.
 - **Ensuring that Openreach is more responsive to the demands of its customers and goes further in investing in new networks.** We set out our intention to reform Openreach's governance, giving it greater independence to take its own decisions on budget, investment and strategy.
 - **Working with the UK Government to give every home and business in the UK the right to request decent broadband.**

We have made good progress in implementing our strategy to date

- 2.5 We have made good progress in implementing our strategy through our programme of telecoms market reviews. The two main market reviews we undertake are the Wholesale Local Access ('WLA') market review and the Business Connectivity market review ('BCMR').

² Ofcom, February 2016. Initial conclusions from the Strategic Review of Digital Communications. <https://www.ofcom.org.uk/consultations-and-statements/category-1/dcr-discussion>

The WLA market review looks at the markets for broadband and telephone services, most commonly used by households and small businesses. The BCMR looks at the markets for leased lines, most commonly used by larger businesses and communications providers.

- 2.6 Incentivising investment in broadband networks was a central objective in our WLA 2018 review.³ This review substantially improved access to Openreach's ducts and poles, reducing the costs for competitors to build their own full-fibre networks. We also recognised that competing providers will only invest in building their own networks if this is more attractive than buying wholesale services from Openreach. In response, the WLA 2018 review set prices for Openreach's wholesale services in a way that supported investment in rival networks. This included introducing a charge control on Openreach's prices for its 'up to 40Mbit/s' wholesale services, to protect consumers, while allowing continued pricing flexibility for higher speed services.
- 2.7 Under the market review framework, any remedies we impose must address specific competition concerns identified in the market being assessed at the time. As a result, the duct and pole access remedy imposed in the WLA 2018 review includes some restrictions to ensure it is primarily used for deploying broadband and telephony networks.
- 2.8 Alongside our programme of market reviews, we have reformed the structure and governance of Openreach to give it greater independence from BT Group. In March 2017, BT notified Ofcom of voluntary commitments to legally separate Openreach, so that it will become a distinct company. This means Openreach having its own staff, management and strategy, and a legal purpose to serve all customers equally. In June 2018 we published our first assessment of progress towards Openreach reform.⁴ We reported that progress towards legal separation has been broadly satisfactory, with many of the governance changes now implemented, but some remaining steps have yet to be completed.
- 2.9 We have also advised Government on the design of a universal service obligation, which would give everyone a right to request a decent broadband connection. In March 2018, the Government introduced legislation for the obligation and we are now responsible for implementing it. In June 2018 we explained how we will designate Universal Service Provider(s) to deliver the obligation and invited expressions of interest.⁵ We expect to be in a position to designate Universal Service Provider(s) in summer 2019.
- 2.10 We have also set in place tougher standards of quality on Openreach, particularly in the business area where service was unacceptable. For residential consumers we have improved the information available to customers about quality of service from different operators, and, from 2019, established automatic compensation for when things go wrong.

³ Ofcom, March 2018. Wholesale local access market review. <https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review>

⁴ Ofcom, June 2018. Ofcom reports on more independent Openreach. <https://www.ofcom.org.uk/about-ofcom/latest/media/media-releases/2018/report-independent-openreach>

⁵ Ofcom, June 2018. Implementing the Broadband Universal Service Obligation. https://www.ofcom.org.uk/_data/assets/pdf_file/0013/115042/implementing-broadband-uso.pdf

And we agreed with BT a price cut of 37% – £7 per month – for people who only take a landline from the company, many of whom are vulnerable.⁶

- 2.11 The Government has also taken action to support full-fibre investment to meet its target of having full-fibre networks available to 15 million premises by 2025. Its Local Full Fibre Networks programme aims to stimulate commercial investment in full-fibre networks across the UK by making sustainable commercial deployments viable. As part of this programme, Government has provided a £200m capital grant, which is being awarded on a competitive basis to local bodies who can stimulate the market to build new or extend existing fibre networks in their local areas. It has provided a further £67m to fund the Gigabit Broadband voucher scheme for small businesses and local communities to contribute to the cost of fibre installation. The Government has also implemented a five-year 100% business rates relief for new fibre infrastructure.
- 2.12 In the FTIR, the Government has outlined further actions to support full fibre investment building on the actions outlined above.⁷ These include:
- proposals to address barriers to network deployment and reduce costs such as reform of the wayleave regime and streamlining the permits regime;
 - a proposal to support early full fibre deployment in non-competitive areas; and
 - setting up a mechanism to oversee the planning process for switch-over from the copper network to fibre networks.

We have seen encouraging signs from industry

- 2.13 In light of our strategy, Government support and wider market developments, industry has been taking steps to invest in more fibre. Around 1.2 million (4%) UK premises are now able to receive full-fibre services, more than twice as many as in 2016.⁸
- 2.14 In recent months a number of full-fibre operators have attracted new investors, including from institutions focused on infrastructure investment. A range of recent commitments by these providers, alongside more established operators, could see up to six million premises covered by full fibre by 2020. Some of the most significant announcements include:
- CityFibre has partnered with Vodafone to deliver full fibre to one million homes by 2021, with the possibility of later expansion to five million by 2025. CityFibre has recently been acquired by a consortium of Antin Infrastructure Partners and West Street Infrastructure Partners, a fund managed by Goldman Sachs.⁹
 - Hyperoptic has an ambition to pass two million homes and businesses by 2022.

⁶ Ofcom, March 2018. Bills cut for BT landline-only customers from Sunday. <https://www.ofcom.org.uk/about-ofcom/latest/features-and-news/bt-landline-price-cut>

⁷ Department for Digital, Culture, Media & Sport, July 2018. Forging a full fibre broadband and 5G future for all. <https://www.gov.uk/government/news/forging-a-full-fibre-broadband-and-5g-future-for-all>

⁸ Ofcom, April 2018. Connected Nations Update. https://www.ofcom.org.uk/data/assets/pdf_file/0017/113543/Connected-Nations-update-Spring-2018.pdf

⁹ CityFibre, June 2018. CityFibre to delist from AIM. <https://www.cityfibre.com/news/cityfibre-delist-aim/>

- Virgin Media's Project Lightning expansion is building out its ultrafast network to 60% of UK premises using a combination of coaxial cable and full-fibre, with the aim of providing two million homes with full-fibre by 2020.
- TalkTalk, in partnership with Infracapital, has an ambition to reach three million homes with full fibre in the medium term.
- Openreach has announced plans to pass a total of three million homes with full fibre by 2020, and aims to reach 10 million homes by 2025.
- Openreach has become more responsive to early investment proposals from its wholesale customers under the new model of legal separation, including co-investment and risk sharing arrangements.

2.15 Taken together, these announcements are a sign of positive intent from industry for more fibre deployment. It is vital this momentum builds, and we would expect to see bolder commitments to full fibre over time. The nature of building fibre networks mean that these will necessarily be long-term projects, with investments taking several years to complete and running well into the 2020s.

Investment in full-fibre networks will require a change to our detailed regulatory approaches

2.16 Increasing availability of full fibre could result in a change in the services available to, and used by, consumers and businesses. Investment could change the structure of the market, as new providers invest in their own networks and compete with Openreach. As operators focus their build plans on different parts of the country, competitive intensity will increasingly vary by geographic area. As a result, we must ensure that our regulatory approach adapts to reflect changing market dynamics.

2.17 Regulation must also prepare for the transition from legacy copper to full-fibre networks. Consumers will increasingly take-up full-fibre services, and eventually the copper network will be decommissioned.

2.18 Our regulatory approach will need to respond to these prospective changes in two main areas. We intend to:

- **Reform our approach to telecoms competition assessments to better support investment in full-fibre networks.** We will focus regulation on providing access to Openreach's physical infrastructure to address enduring market power where it is present, as discussed in Section 3. This will support proposals to extend the circumstances where rival telecoms operators can use Openreach's ducts and poles to deploy their own full-fibre networks. We will also tailor our regulation in different geographic areas to reflect the local competitive landscape, as discussed in Section 4.
- **Support and manage a smooth transition from legacy copper networks to full-fibre,** ensuring that consumers are protected throughout the transition period. We discuss this in Section 5.

A longer period for reviewing telecoms markets will provide more certainty and stability

- 2.19 We agree with industry stakeholders that major fibre investments require greater certainty, over a longer timescale, than the current three-year market review cycle.
- 2.20 We support changes to European legislation to extend the period for market reviews. A longer period for reviewing telecoms markets will reflect that network deployment takes time, and would provide more regulatory certainty for industry, supporting investment.
- 2.21 In light of this, we intend that our new programme of competition assessments will be conducted on a forward-looking basis for at least a five-year period.

Government has also provided views on how policy and regulation can support investment

- 2.22 We welcome the findings of the Government's FTIR. We share the Government's desire to see widespread availability of full fibre and 5G networks and we agree their finding that promoting competition and investment is the best way to deliver that in most of the country.
- 2.23 In areas where competition will not support the rollout of full fibre networks, we agree that a different approach is needed and welcome the Government's finding that intervention in this area will be necessary.
- 2.24 Separately, the National Infrastructure Commission has published its National Infrastructure Assessment¹⁰ which recommended that Ofcom should provide certainty to commercial investors and encourage further private sector delivery of full fibre. The report also recommended a taxpayer-subsidised infrastructure delivery scheme to deliver full-fibre broadband to uncommercial areas.
- 2.25 The findings of the FTIR and the National Infrastructure Commission's National Infrastructure Assessment are consistent with our strategy which we first set out in our 2016 Review of Digital Communications, and which we elaborate on further in this document. It is important to have policy, regulation and industry all pulling in the same direction to meet our shared ambitions for the future of digital infrastructure in the UK.

¹⁰ National Infrastructure Commission, National Infrastructure Assessment, July 2018 https://www.nic.org.uk/wp-content/uploads/CCS001_CCS0618917350-001_NIC-NIA_Accessible.pdf

3. Promoting network investment through access to ducts and poles

- 3.1 To ensure regulation supports new investment in the long-term, we are building on the progress outlined so far by making structural changes to the way we review telecoms markets.

Regulation must reflect the effect of the rollout of full fibre

- 3.2 Historically, the distinction between the review of WLA and BCMR markets has made sense. The technical capabilities and limitations of telecoms networks meant there was a clear difference between the services used by large businesses and those used by households and smaller businesses. While copper and fibre-to-the-cabinet networks could meet the needs of most households and small businesses, large businesses and communications providers often needed high-speed, high-capacity, dedicated leased lines.
- 3.3 Full-fibre networks can deliver significantly higher speeds than copper or fibre-to-the-cabinet networks. Full-fibre networks are also more consistent and reliable than existing copper-based networks. As a result, operators of full-fibre networks are increasingly looking to offer a range of services to households, small and large businesses, and communications providers, building as far as possible on the same underlying multifunctional, fibre-rich network.
- 3.4 In this context, considering WLA and the BCMR markets separately is no longer appropriate. Even where the services may continue to be distinct for certain uses, a holistic consideration of services being operated over multi-functional networks is necessary.
- 3.5 Like fixed telecoms services, wireless technology is also evolving rapidly. The potential for wireless services to substitute for fixed networks has been a subject of debate for several years. Wireless networks could meet the complete needs of some consumers and businesses. But for others, wireless will not be able to match the capabilities of fixed networks, with some continued limitations due to the shared infrastructure involved. This would manifest itself, for example, through poorer service during busy times when the network is contended.
- 3.6 More importantly, regardless of substitution or complementarity, enhanced mobile and fixed wireless services will increasingly use common wireless infrastructure and technology.
- 3.7 To reflect the technical capabilities of full-fibre networks, we will now consider access to networks and services more holistically, focusing first and foremost on encouraging network competition and investment by facilitating access to physical infrastructure.

We have over time focused regulation on promoting network competition and investment

- 3.8 Before the DCR, our regulatory approach focused on requiring Openreach to provide wholesale access to its network to allow competitors to offer downstream services in competition with BT. These ‘downstream’ services are segmented into different types: for example, broadband services (primarily used by households and small businesses) and leased lines (used by larger businesses and communications providers).
- 3.9 The legal separation of Openreach means that it now has autonomy over its budget, strategy and operational decision-making. However, Openreach still has market power. So, while Openreach continues to control the use and development of the upstream network(s), it is subject to regulation of the downstream use of these networks.
- 3.10 This approach has succeeded in encouraging downstream competition to the benefit of consumers (for example, in retail broadband services). Although we have seen scale competitors challenge BT at the retail level, there is not yet sufficient competition to Openreach at the network level. While regulation has helped to encourage the deployment of next generation broadband, Openreach retains significant control over the pace and nature of changes in the network and the services delivered on it (for example, the move from copper to fibre-based broadband). As a result, rival telecoms operators have had to align their services strategy to that of Openreach.
- 3.11 In order to drive increased competition at the network level, we have over time focused regulation on addressing the enduring market power that stems from Openreach’s existing physical telecoms network, based around its ducts and poles. Duct and pole access has been designed to enable competing providers to drive innovation and investment in the underlying networks themselves, thereby challenging Openreach’s position and control of the UK’s main national telecoms network.

We plan to introduce proposals to give Openreach’s competitors unrestricted access to its duct and pole infrastructure

- 3.12 Openreach’s control of the main telecoms network gives it a significant competitive advantage in the deployment of full-fibre networks. Openreach has a cost advantage over competitors and can deploy networks more quickly than its rivals by using its existing network. New market entrants face higher costs than Openreach, because they have no existing ducts or poles to use and must instead build a new network, which involves incurring high fixed costs.
- 3.13 Measures that facilitate greater use of Openreach’s network of ducts and poles where it is found to have significant market power can help to address Openreach’s advantage in deploying fibre networks. These measures would help to improve the business case for investment in fibre for rival operators by lowering costs, and also help to improve the incentives for operators other than Openreach to invest in their own networks.

Regulatory certainty to support investment in full-fibre broadband

- 3.14 In the DCR, we set out our intention to require Openreach to provide greatly improved systems and processes for access to its ducts and poles. As a result, a number of network providers are considering using duct and pole access for planned full-fibre networks.
- 3.15 Our current approach to reviewing telecoms markets, however, means that operators considering the use of Openreach's duct and poles do not necessarily have the full flexibility they may need, due to the restrictions on the existing remedy. For instance, a provider may want to use duct and pole access to provide leased lines for businesses, mobile backhaul for mobile operators (for example, for small cells) and, only later, fixed broadband services for residential consumers. While such mixed usage is possible now in certain circumstances, providers must demonstrate that they have sufficient intention to deploy broadband when they access Openreach's ducts and poles (for example, committed funding or orders for equipment for broadband). Such restrictions create uncertainty and lack of flexibility that Openreach itself does not face.
- 3.16 We are increasingly focused on the scope and potential for network competition and investment, to increase the roll-out of multi-purpose fibre networks. This means regulation can consider remedies to potential market power more holistically, and better reflect the reality of how networks will increasingly be built to meet the demands of people and businesses. As part of this, we aim to introduce unrestricted duct and pole access remedies where there is market power.

We will set out more detailed plans in the autumn

- 3.17 To provide greater flexibility to operators, we will put forward proposals in the autumn that seek to provide unrestricted access to Openreach's ducts and poles, with a view to having the remedy take effect from the start of 2020. An unrestricted remedy would better reflect the needs of operators looking to invest in full-fibre networks to provide a range of downstream services. This is particularly important as we expect a range of different business models to emerge for new full-fibre networks.

4. Reflecting varying competitive intensity in different geographic areas

As network investment and competition emerges, the regulatory approach to downstream services will need to evolve

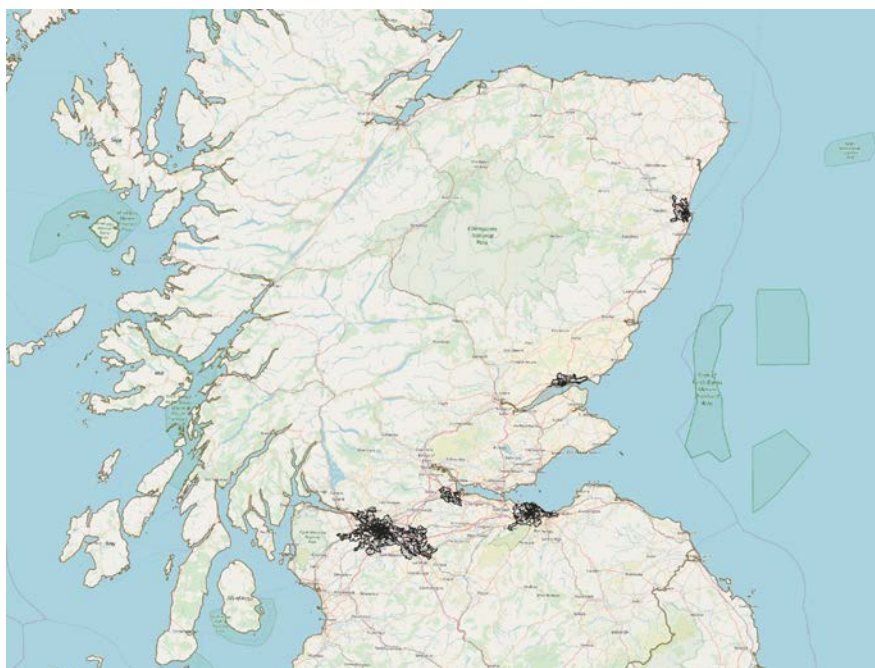
- 4.1 Competition, incentivised by duct and pole access, is likely to materialise at different rates across the UK. Operators tell us that several factors, such as population density, build costs and level of competition, are relevant to where they deploy networks. In remote parts of the country, the commercial case for infrastructure investment can be challenging; the costs are higher, and there are fewer potential customers to recover these costs from.
- 4.2 Over time, variability between geographies is likely to become increasingly important. We will need to consider how competitive intensity and network deployment differ in different geographic areas, with our regulatory approach varying depending on these factors.
- 4.3 New full-fibre networks are still in the process of being deployed and at this stage there is considerable uncertainty over where operators may choose to build. Given this lack of clarity, it will be difficult to determine where infrastructure competition will materialise. Over time, it will become increasingly apparent where infrastructure competition has emerged. This means an iterative approach to geographic regulation may be required.

Over time, we expect there to be three broad geo-types: competitive, potentially competitive and non-competitive

- 4.4 Our hypothesis is that we will need to recognise at least three different geographic areas: competitive, potentially competitive, and non-competitive. By recognising different geographic areas, we can tailor our regulatory approach to the differing competitive conditions of each area.
- 4.5 **Competitive areas** will be locations where there is the presence of competing network infrastructure. We will look at the number, quality and coverage of infrastructure providers in an area to determine whether it is competitive. If there are three competing fixed networks available to the majority of premises within a defined geographic area, the area may be classified as competitive. However, we will consider a range of other factors in any analysis of competition, including market shares, the strength of competitors and the ease of switching between networks.
- 4.6 **Potentially competitive areas** will be locations where we believe competition between fixed networks could emerge. This would include areas where networks have been deployed, but without yet attracting significant numbers of customers; or are planned to be deployed; or where future build could be economic.
- 4.7 We will identify the geographic areas based on the key factors we identify as important, building on the information that we receive from operators. One key aspect of determining

where build could be economic may be the number of premises within an area. For example, if we identified that at least 40,000 premises were needed to justify build in a given area, the map in Figure 4.1 illustrates the clusters of premises in cities, towns and villages in Scotland where build could be economic, based on Ordnance Survey data.¹¹

Figure 4.1: Map of Scotland's postcode areas with >40,000 premises



- 4.8 However, the number of premises in an area is only one of the metrics that we will need to consider when determining whether an area is potentially competitive. To refine our analysis, we will discuss with stakeholders the key factors in their assessment of where new infrastructure build may be economic.
- 4.9 In the DCR, we said a good outcome would be to achieve network competition of around 40% of households. Since then, we have seen encouraging signs from industry with alternative network providers announcing plans to cover up to six million homes by 2020 and setting out intentions to pass nearly 14 million homes and businesses with full fibre infrastructure by 2025. This could mean competition drives fibre deployment to a greater proportion of the UK. The FTIR has similarly estimated that around 30 - 60% of the country could support three or more competing gigabit capable networks.
- 4.10 However, it remains unclear exactly where new entrant fibre deployments might be built. In considering potentially competitive areas, we will look at those areas that have

¹¹ Our analysis relies on data from the Connected Nations 2017 Data Analysis, https://www.ofcom.org.uk/_data/assets/pdf_file/0016/108511/connected-nations-2017.pdf. The Connected Nations dataset relies on premises data from the Ordnance Survey (OS) AddressBase® Premium dataset (May 2017 version, Epoch 49) and the OS AddressBase® Islands dataset (May 2017 version, Epoch 49). This has been combined with additional geographic classifications from the ONS National Statistics Postcode Lookup (NSPL) (May 2017 version) and Urban and Rural categories derived from the Locale classification (February 2017 version). Unique Property Reference Numbers (UPRNs) are built in, and UPRNs with PO Box numbers have been excluded. UPRNs where Local Custodian Code is 7655 have also been excluded. Small (S) and Large (L) premises have been included.

underlying economic characteristics that could support new entrant fibre build. Our initial view is that up to 60% of premises are in areas that could be attractive to new entrants building fibre networks, given the common underlying economic characteristics of these areas. While new-entrant investment may not cover this entire area, our estimate indicates the possible scope of the potentially competitive area where we might see network competition as a result of market investment, building on duct and pole access.

- 4.11 Over time, as new entrant investment occurs, and competition emerges, we would look to classify areas as competitive and deregulate. Identifying potentially competitive areas will be a feature of our autumn 2018 consultation on geographic markets, where we will consult with network builders on how they identify where new networks could be deployed.
- 4.12 **Non-competitive areas** will be parts of the country where the business case for fibre investment is more challenging – usually because the cost of network deployment is prohibitively high for new entrants relative to the potential demand for fibre services. In these areas there is little prospect of network competition emerging: in parts Openreach may be the sole fibre infrastructure provider, in other parts there may be no commercial case for fibre investment without supporting public intervention.

We will look to deregulate in competitive areas

- 4.13 In competitive areas, Openreach will no longer be required to provide wholesale access to its services. Competition between networks, supported by duct and pole access, will drive good outcomes for consumers in terms of pricing, investment and innovation.
- 4.14 At the same time, interventions may continue to be required to ensure vulnerable consumers remain protected. For example, this year we intervened to ensure a cut in prices for consumers who only take a landline from their provider. Prices had been unacceptably high due to poor competition and low engagement in the landline-only market.

In potentially competitive areas, we will incentivise investment while ensuring consumers remain protected

- 4.15 In potentially competitive areas, we want to create the best environment to incentivise investment. We would design regulation to encourage network deployment, recognising that competing providers will only invest in building their own networks if this is more attractive than buying wholesale services from BT.
- 4.16 We will need to balance incentivising network investment with the risk that, without downstream regulation, and until new networks are built, consumers could face higher retail prices in the short term without seeing any fibre investment. In the WLA 2018, we recognised that pricing flexibility for higher-speed services would help support investment opportunities in full fibre. However, users of copper-based networks, which deliver lower-speed superfast broadband, needed to be protected from the risk of high prices. Therefore, we introduced a charge control on Openreach's most popular wholesale

broadband service – which offers 40 Mbit/s download speed, and 10 Mbit/s upload speed – to strike the right balance between encouraging network investment and protecting consumers.

- 4.17 Looking forward, in potentially competitive areas, we expect to continue with our current approach of allowing pricing flexibility on high bandwidth services and not to regulate download speeds above 40 Mbit/s.
- 4.18 Over time, as demand for higher speed services increases, the number of consumers buying superfast broadband products will also grow. As take up of superfast broadband services increases, the unit cost of providing superfast broadband may fall. While this will affect the regulated price of anchor products, we will also consider several other factors:
- As the transition to fibre progresses, we expect the volume of copper-based services to decline. As most of the costs associated with network investment are fixed, this change could have implications for Openreach’s ability to recover the costs associated with the existing copper network. While all consumers will eventually move over to the new fibre network, we want to ensure that consumers are protected from fluctuating prices during the transition period, and that quality of services standards are maintained.
 - When determining the price of Openreach’s regulated services, we may also consider competitor fibre build costs, rather than focusing solely on Openreach’s own costs. We recognise the significant economies of scale and scope enjoyed by Openreach may not be available to new market entrants.
 - Services over new full-fibre networks would be expected to be of higher quality, and greater value, to consumers and businesses. Therefore, where the focus of anchor regulation moved to full-fibre network-based services, it may be reasonable to price this at a small premium to reflect its greater value.
- 4.19 While there are many factors for us to consider when setting the regulated price of the anchor products throughout the transition period, our main objective is to ensure there is stable and consistent pricing for consumers. Volatile prices during the transition from copper to full-fibre networks would cause uncertainty, potentially undermining consumer confidence in the new network and services. As such, we see significant value in broadly stable anchor pricing during switchover, taking into account inflation. This stability would allow for investment certainty and a managed migration to new services.
- 4.20 The roll-out of full fibre networks will need to be reflected in our regulation over time. Unrestricted duct and pole access would reduce the build costs for supplying leased lines to many businesses. However, we recognise that much of the industry currently depends on access to leased lines from Openreach, and so there will be a transition period while the industry adapts to a different model of competition.
- 4.21 Where we regulate leased line services, we will protect consumers without undermining the business case for fibre deployment. For example, we could allow pricing flexibility for high-bandwidth leased lines.
- 4.22 Another key element of designing regulation to encourage network deployment is how quickly we remove regulation as competing networks are announced and deployed. We

could follow an approach which includes proactive deregulation in various forms, for example, removal of restrictions on Openreach's ability to discount prices or requirement to provide specific forms of access. However, if we were to take this approach we would need to be confident that such proactive deregulation would not harm competitors' investment in new networks. We would also consider the lead time required for network build and the scope for consumer harm in the intervening period.

In non-competitive areas, we will ensure measures are in place to deliver good outcomes for consumers while supporting investment

- 4.23 In non-competitive areas, our objectives are to promote retail competition, protect consumers from high prices, and encourage investment by Openreach as far as possible.
- 4.24 In these areas, further regulation to give access to Openreach's physical network may be necessary. While our strategy is to promote competition upstream through duct and pole access, challenging economics may limit the prospect of new network entry in the non-competitive area. Where duct and pole access does not promote competition, we want to ensure that consumers are still able to benefit from increased choice and innovation. Therefore, we believe there could be a case for requiring Openreach to offer dark fibre in the non-competitive area to deliver good outcomes for business and wholesale customers. We will also need to consider what regulation is needed on broadband to deliver good outcomes for residential consumers in these areas.
- 4.25 A dark fibre remedy would require Openreach to provide unlit strands of its optical fibre, to which access seekers could attach their own electronic equipment to deliver business connectivity services. This would enable the development of new products and services independently of Openreach, as it would allow access seekers to choose and manage the electronic equipment at the ends of the fibre. Therefore, dark fibre would provide an opportunity to innovate and offer differentiated services where network build is challenging.
- 4.26 We will also need to ensure that there is adequate choice and value for money for residential broadband users. So, we expect to continue with our current approach of regulating wholesale services. Wholesale access to the Openreach network will remain important to protect consumers in those areas where we are unlikely to see competition between networks. Our approach here will continue to be based on price regulation of key access services, with a focus on consumer protection.
- 4.27 Over time, we may seek to tighten regulation to ensure consumers are safeguarded from harm where choice of providers is more limited. For example, we could consider controlling prices for speeds above 40 Mbit/s, to ensure value for consumers where network competition is not feasible. Here we will be mindful of the need to ensure that Openreach retains incentives to build full fibre networks in these areas.
- 4.28 We will consult in the autumn on our proposed approach to defining markets for wholesale services, including our approach to product market definitions.

Public policy will also be required to deliver truly widespread availability

- 4.29 We believe our approach to regulation of Openreach's services will play an important role in providing incentives for Openreach and rival operators to invest across the UK. However, we recognise that in non-competitive areas, regulation is only part of the solution to securing better outcomes for consumers, and public intervention may also be required.
- 4.30 Separately to our work on competition assessments, we are working with Government to implement a broadband universal service obligation, which would give everyone the right to request a decent broadband connection.
- 4.31 Additionally, the Government has recently announced a proposal to intervene to support the deployment of full-fibre networks in non-competitive areas. It has proposed an 'outside-in' approach, ensuring that fibre network build starts early in non-competitive areas and anticipates some level of public subsidy will likely be required.

Where we regulate, we remain committed to a fair-bet for Openreach

We support the fair bet principle for risky investments

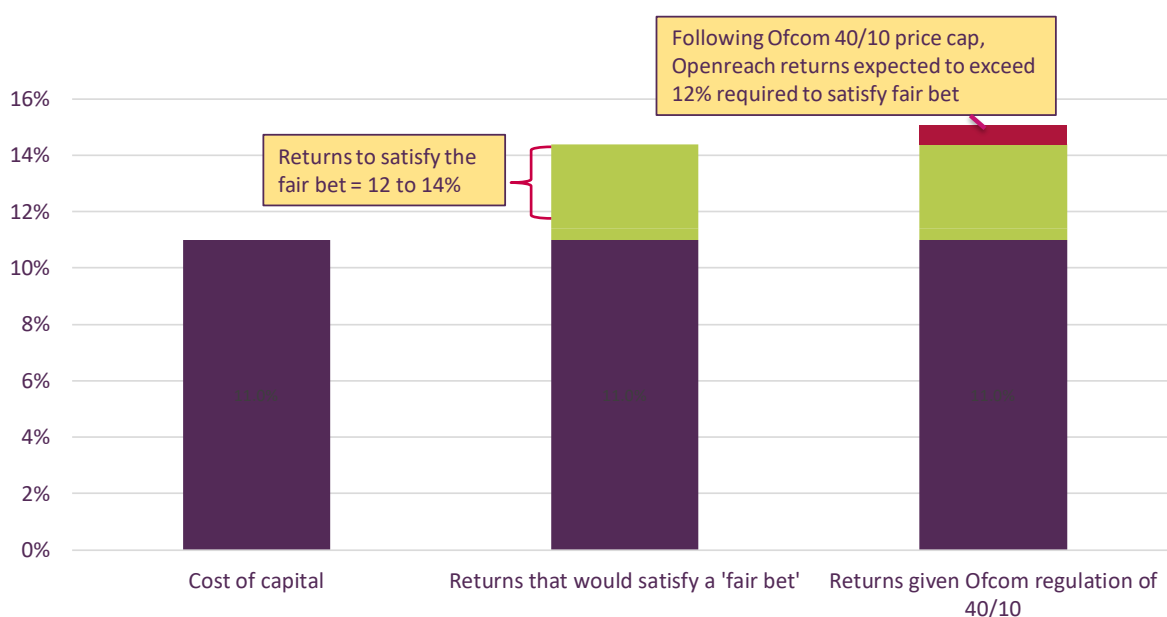
- 4.32 We recognise that Openreach needs the opportunity to make higher than expected returns when a risky investment is successful in order to compensate it for the chance of a risky investment failing and making less than expected returns. We call this the fair bet principle.
- 4.33 In practice, this means that we hold off from regulating the prices of new risky investments until the investments have proved to be successful. Even then, we would only regulate prices if Openreach had market power and any regulated prices would give Openreach the ability to earn returns above its normal cost of capital.
- 4.34 This raises two obvious questions: how and when do we determine that an investment has been successful, and what return above the normal cost of capital will be allowed? These are not easy questions to answer ex-ante, as each investment will have a different risk profile. Moreover, many investments are made in stages and each of these stages is likely to have a different risk profile. For example, investing in a new service for the first one million customers will be riskier than investing in the same service three years later to increase availability from 10 to 15 million. This is because both supply and demand conditions will be better understood for the later tranches of investment.
- 4.35 The best way to illustrate our approach to the fair bet is to consider the regulatory approach we took to Openreach's superfast broadband investments. Openreach benefitted from a period of pricing flexibility on superfast services from 2008/09 when it began its superfast broadband investment through to March 2018, when for the first time we imposed a charge control, limited to Openreach's 'up to 40 Mbit/s' wholesale service.

We decided it made sense to introduce a charge control after determining that the fair bet had been met and that, absent regulation, Openreach would have the incentive and ability to set charges for wholesale superfast services at an excessively high level with the potential to distort competition.

4.36 As a result of our policy of pricing flexibility, Openreach has achieved cumulative returns significantly higher than the 11% cost of capital relevant at the time of those investments.

4.37 Despite Openreach’s market power we were careful to not intervene too early. Our decision to set a charge control on Openreach’s 40 Mbit/s wholesale service took full account of the upfront risks that Openreach had faced. We concluded that, given the nature of these particular investments, Openreach should be given the ability to earn cumulative returns in the range 12% to 14% to compensate it for the upfront risks and provide a fair bet. Even with our introduction of a charge control on the 40 Mbit/s service, we estimate that Openreach’s actual returns on these investments will be around 15%.¹² This is illustrated in Figure 4.2 below.

Figure 4.2: Openreach’s fair bet on its superfast broadband investments



We will continue to use the fair bet principle in relation to full-fibre

4.38 We intend to apply a similar approach to ensuring that Openreach has a fair bet on its future full-fibre investments, where these involve significant downside risks.

4.39 In principle, it could be possible to give even more certainty to investors. For example, we might seek to reach a conclusion on the appropriate cost of capital that should be used when undertaking any future fair bet assessment. Alternatively, we could seek to evaluate up-front the risks that Openreach faces in its full fibre investments. Based on the upfront

¹² Ofcom, March 2018. Wholesale local access market review. Annex 6. https://www.ofcom.org.uk/_data/assets/pdf_file/0021/112476/wla-statement-annexes-1-9.pdf

analysis, it might be possible to pre-specify the long run period over which Openreach will have pricing flexibility. There may also be other ways of providing more detailed guidance on the circumstances in which we might conclude in future that the fair bet had been met.

- 4.40 There would be significant challenges in these approaches, but we will explore further the feasibility of offering greater certainty of this type in future competition assessments.

5. Transitioning from copper to fibre

Full-fibre investment will lead to a more rapid transition away from copper networks

- 5.1 Plans for full-fibre deployment by Openreach and competitors will place into focus the need to transition away from the UK's ageing copper network. During any transition period, Openreach will continue to operate its copper network in parallel with its full-fibre network. Eventually, the copper network will be decommissioned. The switchover from copper to fibre will cut costs: Openreach will no longer have to run two networks at once and will benefit from the cost savings associated with the lower fault rates of fibre networks.
- 5.2 The transition from copper to fibre networks will also deliver positive outcomes for consumers, providing a better, more reliable service. We expect the move from copper to fibre to be primarily driven by consumer demand for new full-fibre and ultrafast services, though some final migration may need to be compulsory to enable copper switch-off (as was the case for the analogue to digital TV switchover, for instance).
- 5.3 Overall, we support a well-managed transition from copper to full-fibre networks. We will adopt policies that both promote investment and protect consumers during this period of significant change.
- 5.4 Any decision to switch off the copper network is one for Openreach. However, regulation does have a role in addressing questions of the process of transition (when and how copper network transition will take place), and its implications for consumers, businesses and industry. Openreach has so far provided a high-level outline of its potential plan and timing for network transition. The specific effects on regulation will depend on specific proposals from Openreach, and its engagement with its customers.

There are several key considerations for the transition period, but we will ensure the regulatory regime is clear and predictable

- 5.5 A carefully-managed transition will be important to ensure that consumers and businesses do not experience disruption and their confidence in new ultrafast networks is not undermined. Stable and predictable regulation will be crucial to help achieve this. Regulation will also need to be transparent; consumers, businesses and communications providers will need to know what to expect during the migration period. Regulation will need to support the transition from copper to full-fibre networks in several areas:
 - **Quality of service:** Openreach must continue to dedicate sufficient resources to ensure that the quality of copper services does not suffer in the run-up to, or during, the transition period.
 - **Stranded assets:** Given that the deployment of fibre will ultimately end the life of Openreach's copper assets, there is a risk that Openreach could be left with

unrecovered (or 'stranded') copper assets at the point of copper switch off. We will need to consider how any such costs are recovered, taking into account our desire to maintain good quality of service on the copper network, competitive intensity and regulation, investment incentives for Openreach, and the effects on consumer prices.

- **Pricing consistency:** We see significant value in stable regulated wholesale prices that allow for investment certainty, and a managed migration to new services. Volatile prices as switchover takes place would cause uncertainty, likely undermining consumer confidence in the new network and services.
- **Migration process for wholesalers:** The migration process needs to consider the effects on all of Openreach's downstream customers, such as Sky, TalkTalk and Vodafone, as well as BT Consumer.

5.6 Several of the issues outlined above require detailed analysis and consultation before we can set out our intended approach to the transition period. As noted above, we expect the transition process will be led by Openreach. Openreach's detailed proposals for transition will also inform our approach on the above issues.

5.7 Overall, we believe a good outcome for consumers would be a migration process that is as smooth as possible, with continued quality of service delivered on legacy copper networks until switch-off, and with stable regulated products and prices throughout the transition.

Regulation will protect consumers during the migration period

We will need to ensure that consumers can benefit from the choice that competition provides

5.8 Where both Openreach and competitors have full-fibre networks, the period of migration from copper to fibre is likely to be important for competition. Customers may be more contestable as they switch networks, and providers using the Openreach network may want to switch their customers to a competitor network. Switching off the copper network is therefore important to the investment incentives of Openreach and its competitors.

5.9 In order for consumers to benefit from the increased choice that competition creates, we would expect any processes and systems that Openreach develops to facilitate migration between its copper and full-fibre networks would also facilitate migration to a competitor's full-fibre network. We expect to work with industry to develop migration processes that provide certainty and support network switching and competition.

Vulnerable consumers may need additional protections

5.10 We recognise that additional, targeted protections may be needed for vulnerable customers and those taking landline-only or basic broadband services. For example, we would expect that vulnerable consumers receive appropriate assistance during the

migration process, and that consumers seeking voice-only or basic internet access services are supported.

We will evolve our regulatory approach to meet changing consumer needs

- 5.11 Traditional corded telephones on copper-based telephone lines can be used to make calls when there is a power cut at the premises, because the lines are powered from the local telephone exchange. But over time, landline services will either be delivered over copper using internet protocol or provided over full-fibre networks. These require power to be provided at the customer premises and in the event of a power cut, without an alternative source of power or communications, customers may no longer be able to call emergency services.
- 5.12 However, consumer behaviour is changing, with greater use of cordless handsets and mobile phones in the home. In light of this, solutions such as battery backup, which Ofcom had previously required be provided to support voice services in premises with a full-fibre connection, may not be appropriate for all consumers. They may not provide protection (in the case of cordless phones), or they could be superfluous (where a customer can use a mobile phone).
- 5.13 In May we consulted on proposed guidance to protect access to emergency services.¹³ Our proposals are technology-neutral and targeted at those consumers most in need of protection. We set out four principles:
- Providers should have at least one solution available to offer consumers;
 - Solutions should be offered free of charge to consumers who are dependent on their landline;
 - The needs of consumers should be assessed by providers to identify those who need a solution; and
 - Providers should ensure that solutions remain appropriate as consumers' circumstances change.
- 5.14 We will publish a statement in autumn 2018.

We will take action as necessary to support competitive network deployment

- 5.15 In planning its own full-fibre network, Openreach could act in a way that has the effect of deterring other operators from deploying their own full-fibre networks. For example, it could offer selective price discounts on long-term contracts to its wholesale customers, including in areas where it faces potential competition from rival networks. In certain

¹³ Ofcom, May 2018. Proposed guidance on protecting access to emergency organisations when there is a power cut at the customer's premises. <https://www.ofcom.org.uk/consultations-and-statements/category-2/access-emergency-organisations-power-cut>

Regulatory certainty to support investment in full-fibre broadband

circumstances this behaviour could be against consumers' interests. For instance, it could result in materially less rollout by rivals.

- 5.16 In the 2018 WLA review, we put in place restrictions on Openreach's ability to discount its fibre-to-the-cabinet prices in particular geographic areas. We will keep under review our position on what further action, if any, is needed.

6. Next steps

We have set out a roadmap for introducing our approach to competition assessments

We propose to introduce unrestricted duct and pole access from 2020

- 6.1 As operators continue to form build plans and deploy networks at increasing pace, we believe that the prompt implementation of an unrestricted duct and pole access remedy will become increasingly important to help facilitate large-scale investment in fibre. So, we propose to introduce an unrestricted duct and pole access remedy as quickly as possible.
- 6.2 We plan to consult in autumn 2018 on a proposal to introduce unrestricted duct and pole access to take effect from the start of 2020. We expect this regulation will be in place for the long term. As it is desirable for future telecoms competition assessments to be aligned going forward, we aim to have this regulation in place until 2026 so it is reviewed at the same time as the new downstream remedies we introduce in 2021. However, given that we are not able to impose regulation for more than five years, we would propose to undertake a review of the remedy at some point in the period from 2020 to 2026.

By April 2021, we expect to have introduced downstream regulation that varies by geographic area

- 6.3 We will consult in the autumn on our proposed approach to defining markets for wholesale services. This will include our approach to product market definitions, in light of changing market dynamics and technology evolution, and our approach to geographic markets. On geographic markets, we plan to consult in the autumn on:
- Our proposed approach to defining geographic areas, considering:
 - Competitive areas where material alternative telecoms networks to Openreach exist and where there is effective network competition within these areas.
 - Potentially competitive areas where investment in material alternative telecoms networks to Openreach is occurring, or could occur; and
 - Non-competitive areas where network competition is unlikely to emerge.
 - Our initial assessment of how the boundaries between areas could be determined.
- 6.4 By April 2021 we intend to have introduced new downstream regulation that varies by geographic area, to be in place for five years (to 2026). We will consult on specific proposals including charge controls for downstream access regulation throughout 2019 and 2020. This will include proposals for dark fibre which are consistent with our strategy of promoting investment in new networks and will build on the decisions we will take in the BCMR 2019.
- 6.5 We took significant steps towards implementing our strategy through downstream regulation in the WLA 2018. We expect to continue with the same underlying principles

established in that review as we move towards our new approach, to ensure consistency with key elements of the existing regulatory regime.

6.6 The introduction of this new downstream regulation will coincide with the expiration of regulation imposed under the WLA 2018 and will replace both the WLA and the BCMR in future. In the intervening period, the current wholesale access requirements defined in the WLA 2018, and set in the forthcoming BCMR 2019, will remain in place. We discuss the BCMR 2019 in more detail below.

We propose carrying out a two-year BCMR 2019, which will expire in 2021

6.7 Regulation imposed under the BCMR 2016 will expire in April 2019. The BCMR 2019 will provide the bridge between our current approach and our proposed new approach to downstream remedies. We will consider the introduction of access to dark fibre in both access markets and core/backhaul markets for business connectivity in a way which is consistent with our strategic objective to promote investment in new networks. For example, we may consider limiting dark fibre to areas or routes where there is unlikely to be investment in competing networks to Openreach. We expect the regulation we impose in the BCMR 2019 to be in place for two years.

6.8 We set out the above timelines in Figure 6.1.

Figure 6.1: Roadmap for regulation

